HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Fax 206.328.5581
Tel 206.324.9530
www.hartcrowser.com

J-2296-07

February 23, 1999

Mr. Gregory Rapp
Construction Services Manager
Potlatch Corporation
1100 Railroad Avenue
P.O. Box 386
St. Maries, Idaho 83861

Re: 1998 Annual Performance Report
Avery Landing Recovery System

Dear Mr. Rapp:

Hart Crowser is pleased to present the Annual Performance Report for 1998 for the free phase hydrocarbon product recovery system at the Avery Landing site. This letter report includes the following three sections, as required by your Consent Order with the State of Idaho Department of Health and Welfare, Division of Environmental Quality (IDEQ):

- **Volume of Product Recovered.** The total volume of product recovered during the year, and the destination of the recovered product;
- **Recovery System Effectiveness.** An analysis of the effectiveness of the recovery system with respect to free product capture; and
- **Schedule.** A schedule for product and water level monitoring in 1999.

System performance data (groundwater elevations and free product thickness) for 1998 were reported in the quarterly performance reports submitted during 1998 to the IDEQ.

VOLUME OF PRODUCT RECOVERED

During 1998, the system recovered approximately 50 gallons of free product from the extraction trenches at the site. The free product was collected in the free product storage tanks. This information is inconsistent with previously collected data which indicated 100 to 200 gallons of free product were collected per operating period prior to 1998. Approximately 415 gallons of free product have been collected over the life of the project. Previous free product measurements were based on calculations using the in-tank dipstick and were sufficient for determining significant changes in free product volume. The current method, using a measuring tape and water finding paste, is more accurate for determining less dramatic volume changes.

A measuring tape and water finding paste will be used for determining future free product volumes.

RECOVERY SYSTEM EFFECTIVENESS

Our evaluation of the recovery system effectiveness in capturing free product before it reaches the river is based on capture zone analysis and the amount of free product removed from the river using oil absorbent booms. Based on these criteria, the 1998 operating season yielded satisfactory results for the Avery Landing site. The system was able to maintain groundwater and free product capture throughout the majority of the season. Unlike previous years, the treatment system groundwater depression pumps were left running all season with the exception of four weeks during extremely cold weather.

Pump Failures and Shutdowns

The following pump failures or shutdowns occurred during the 1998 operating period and were addressed as indicated:

- The extraction pump controller for EW-4 failed on June 24 and was changed out during the June 25 site visit; and
- Extraction wells EW-1 and EW-2 were shutdown in August, as requested by the IDEQ. EW-2 was re-started in October.

Groundwater Capture

Groundwater capture was maintained on the majority of the site during the 1998 operating period. A map containing groundwater elevations was provided in the 3rd Quarter 1998 Performance Report, and has been reproduced as Figure 1 of this document. The shutdown of EW-1 and EW-2 improved the capture ability of EW-3 and EW-4 during low flow periods in the river.

EW-2 was re-started during the October 22 site visit to determine its effect on the operation of EW-3 and EW-4. Periodic cycling of EW-2 and EW-4 after re-start indicated maximum drawdown capability was achieved and EW-4 was not adversely impacted.

Groundwater flow to EW-3 maintained the groundwater elevation above the set shut-off point. For this reason, EW-3 operated on a continuous basis.

Implications for Future Operation

The system continued to be effective as an interception trench for free product. It is anticipated that only wells EW-2, EW-3, and EW-4 will need to be used during the 1999 operating season. It was shown during the 1998 shut-downs that operating EW-2 does not adversely effect the operation of upstream wells and provides a second significant area of groundwater depression. Oil absorbent booms placed along the shore of the river will continue to be used to collect any product that escapes the extraction trench and reaches the river.

1999 SCHEDULE

Table 1 presents the anticipated project schedule for the 1999 monitoring season.

Table 1 - Avery Landing Recovery System
Project Schedule for 1999 Monitoring Year

Scheduled Milestone	Date
Conduct First Quarter Monitoring	March 18, 1999
Submit First Quarter Performance Report	April 23, 1999
Conduct Second Quarter Monitoring	June 24, 1999
Submit Second Quarter Performance Report	July 16, 1999
Conduct Third Quarter Monitoring	September 9, 1999
Submit Third Quarter Performance Report	October 8, 1999
Conduct Fourth Quarter Monitoring	December 2, 1999
Submit Fourth Quarter Performance Report	January 15, 2000
Submit Annual Report	February 5, 2000

This schedule may change due to weather conditions and is based on the results from previous years of sampling.

LIMITATIONS

Work for this project was performed, and this letter prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar location, at the time the work was performed. It is intended for the exclusive use of the Potlatch Corporation for specific application to the referenced property.

If additional information or clarification is required, please call Terry Montoya at (206) 324-9530.

Sincerely,

HART CROWSER, INC.

Dallas Hoover by PMA
DALLAS HOOVER
Staff Remediation Engineer

TERRY MONTOYA
Project Engineer

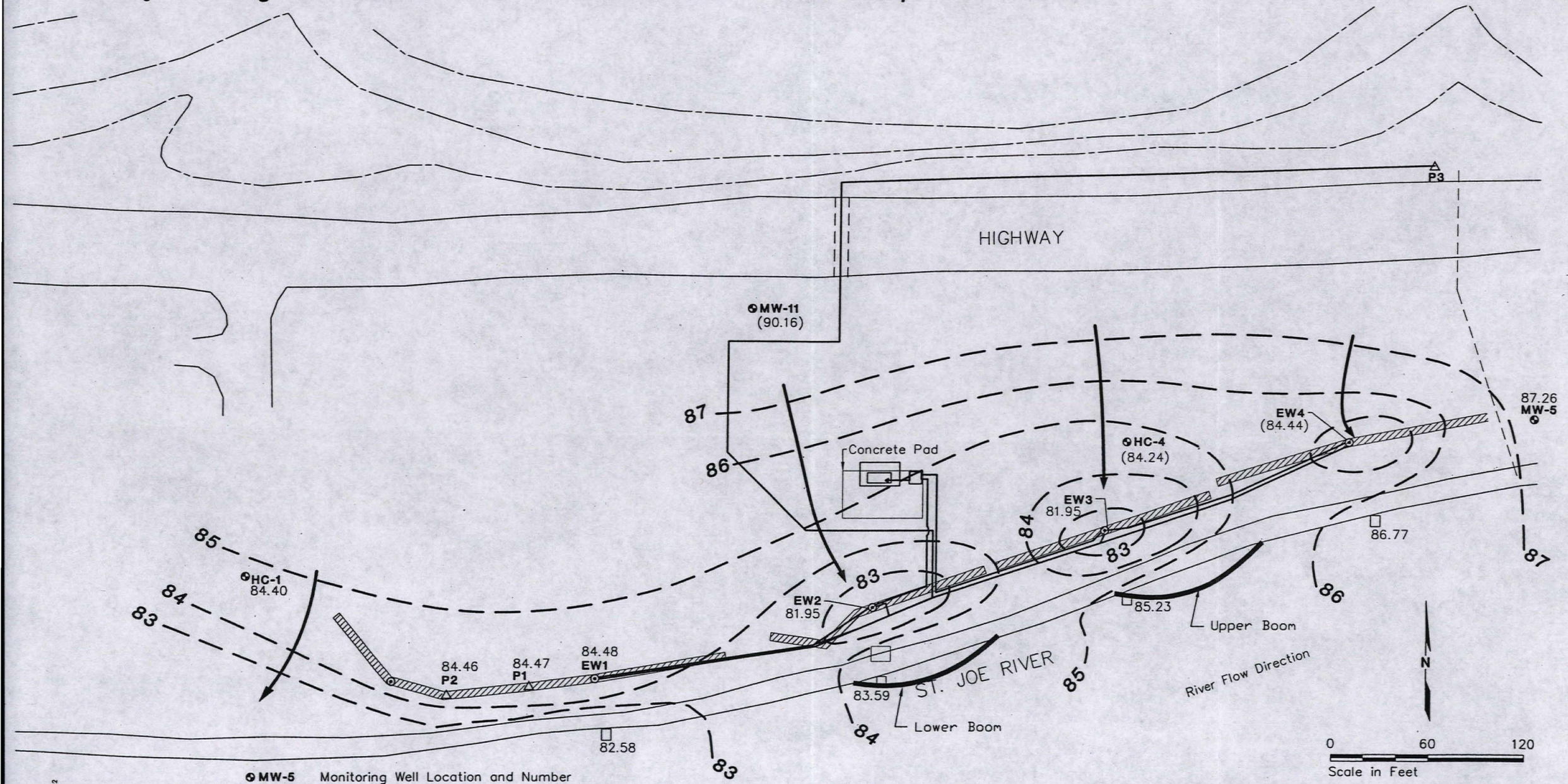
MATT SCHULTZ, P.E.
Senior Associate Remediation Engineer

Attachment: Figure 1 - Avery Landing Third Quarter Groundwater Flow Direction Map

229607/1998Annual.doc

cc: Kreg Beck, Idaho Department of Environmental Quality

Avery Landing Third Quarter Groundwater Flow Direction Map



MW-5	Monitoring Well Location and Number	82.58	Estimated River Elevation in Feet (10/22/98)
87.26	Groundwater Elevation in Feet (10/22/98)	87	Groundwater Elevation Contour in Feet
(84.24)	Corrected Groundwater Elevation due to Free Product in Feet (10/22/98)		Approximate Groundwater Flow Direction
EW1	Extraction Well Location and Number		Extraction Trench
P1	Piezometer Location and Number		

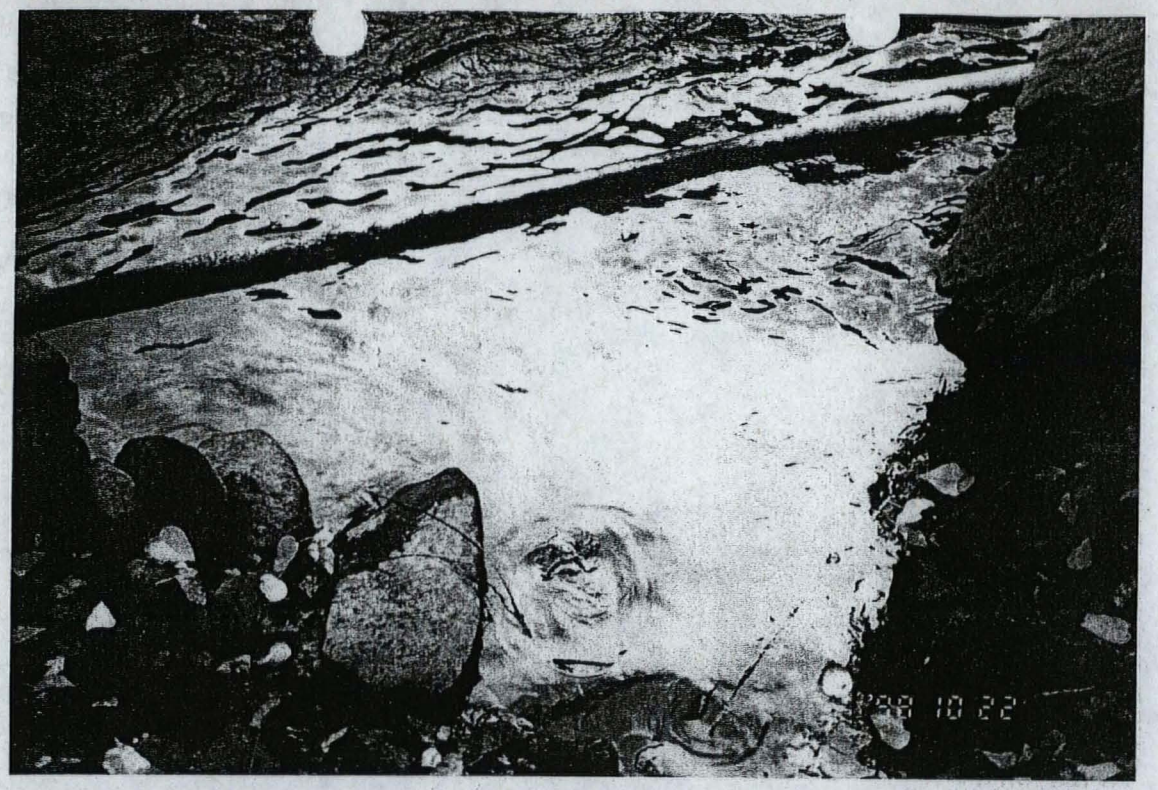
Note: Elevation datum is southwest corner of Concrete Pad (100.00 feet)

HARTCROWSER

J-2296-07 2/99

Figure 1

DMP 2/5/99 1=60 wdstk.pc2
22960704


'98 10 22


'98 10 22